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(54) Thermal transfer image-receiving sheet

Bildempfangsblatt für thermische Farbstoffübertragung

Feuille réceptrice d'image par transfert thermique

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Description

The present invention relates to a thermal transfer image-receiving sheet. More particularly, it relates to a thermal transfer image-receiving sheet having a dye-receptive layer of which the texture is similar to that of the so-called "plain paper."

A thermal transfer sheet comprising a substrate sheet and a dye layer provided on one surface of the substrate sheet has hitherto been used in an output print for computers and word processors by a thermal sublimation dye transfer system. This thermal transfer sheet comprises a heat-resisting substrate sheet and a dye layer formed by coating an ink comprising a mixture of a binder with a sublimable dye on the substrate sheet and drying the resultant coating. Heat is applied to the thermal transfer sheet from the back surface thereof to transfer a number of color dots of three or four colors to a material on which an image is to be transferred, thereby forming a full color image. Since the colorant used is a dye, the image thus formed has excellent sharpness and transparency and high reproduction and gradation of intermediate colors, which enables a high-quality image comparable to the conventional full color photographic image to be formed.

Such a high-quality image, however, cannot be formed on a transfer material undyable with a dye, such as plain paper. In order to solve this problem, a thermal transfer image-receiving sheet comprising a substrate sheet and a dye-receptive layer previously formed on the substrate sheet has been used in the art.

Conventional thermal transfer image-receiving sheets are generally thick and have a dye-receptive layer of which the surface has a texture close to the so-called "photographic paper" rich in gloss, so that in some sense they can be said to give an impression of high grade.

However, in the so-called "applications in office," the gloss of the surface of the dye-receptive layer and the hard texture of the sheet per se give a poor image to users. In order to overcome this problem, a thermal transfer image-receiving sheet, particularly one which has a surface having a texture close to plain paper and can be handled like copying paper, has been desired in the art.

The present invention has been made under these circumstances, and an object of the present invention is to provide a thermal transfer image-receiving sheet, particularly one which particularly has a surface having a texture close to plain paper and can be handled like copying paper.

In order to attain the above object, the present invention provides a thermal transfer image-receiving sheet comprising a substrate sheet and a dye-receptive layer provided directly or through an intermediate layer on one surface of said substrate sheet, said dye-receptive layer having a surface roughness of center line average height Ra = 1.0 - 4.0 µm, maximum height R_{max} = 15.0 - 37.0 µm and 10-point average height Rz = 10.0 - 30.0 µm.

Since the dye-receptive layer constituting the thermal transfer image-receiving sheet has a surface roughness failing within a particular range, the sheet has a surface having a texture close to plain paper and can be handled like copying paper and fits the needs of use in offices.

An image-receiving sheet using a conventional paper substrate sheet with an image being formed thereon is comparable to a print obtained by the conventional printing in texture, such as surface gloss and thickness, and, unlike an image-receiving sheet using the conventional synthetic paper as the substrate sheet, can be bent, and a plurality of sheets thereof may be put on top of one another for bookbinding or filing, which renders the thermal transfer image-receiving sheet using paper as the substrate sheet suitable for various applications. Further, since plain paper is more inexpensive than synthetic paper, the image-receiving sheet can he produced at a lower cost. In such an image-receiving sheet, in order to compensate for the cushioning property of the substrate sheet, it is generally preferred to provide as an interposing layer a layer having a high cushioning property, for example, an expanded layer (foamed layer) comprising a resin and an expanding agent (foaming agent).

Fig. 1 is a cross-sectional view of the thermal transfer image-receiving sheet according to the present invention.

<u>The Invention</u>

Fig. 1 is a schematic cross-sectional view of the thermal transfer image-receiving sheet according to the present invention. In Fig. 1, the thermal transfer image-receiving sheet 1 comprises a substrate sheet 2 and a dye-receptive layer 3 provided on one surface of the substrate sheet 2.

The substrate sheet 2 may comprise a single layer of the so-called "paper" or "resin film (or sheet)." Alternatively, it may have a laminate structure comprising the above "paper" or "resin film (or sheet)" as a core substrate sheet and, laminated on at least one surface thereof, the so-called "synthetic paper." In order to provide a paper-like handle, it is preferred to positively use paper.

Specific examples of the "paper" include wood free paper, paper corresponding to printing paper A specified in JIS P3102, low quality paper, kraft paper, newsprint, glassine paper, art paper, coated paper, cast coated paper, wall paper, backed paper, paper impregnated with a synthetic resin, paper impregnated with an emulsion, paper impregnated with a synthetic rubber latex, paper with a synthetic resin being internally incorporated therein, fiber board, lightweight coated paper and slightly coated paper.

Specific examples of the resin film (or sheet) include resin films (or sheets) of polypropylene, polyethylene, polyes-

ters, polycarbonates, polyethylene naphthalate, polyetherether-ketone, polyamides, polyethersulfone, polystyrene and polyimides. If necessary, titanium oxide, calcium carbonate, talc and other pigments and fillers may be added thereto. Further, an expansion treatment may be carried out for weight reduction and other purposes.

The thickness of the substrate sheet 2 is in the range of from about 40 to 250 µm. In order to realize the texture close to plain paper for applications in OA (office automation), it is particularly preferably in the range of from 60 to 200 µm.

A dye-receptive layer 3 is formed directly or through an intermediate layer on the substrate sheet 2. The dye-receptive layer 3 serves to receive a sublimable dye transferred from a thermal transfer sheet and hold the dye thereon.

The dye-receptive layer 3 is composed mainly of a resin, and examples of the resin include polyolefin resins, such as polypropylene, halogenated polymers, such as polyvinyl chloride and polyvinylidene chloride, vinyl polymers, such as polyvinyl acetate and polyacrylic esters, polyester resins, such as polyethylene terephthalate and polybutylene terephthalate, polystyrene resins, polyamide resins, copolymer resins comprising olefins, such as ethylene or propylene, and other vinyl monomers, ionomers, cellulosic resins, such as cellulose diacetate, and polycarbonates. Among them, vinyl resins and polyester resins are particularly preferred.

In the present invention, the dye-receptive layer 3 is formed so that the surface roughness satisfies the following requirements.

The center line average height (Ra) of the surface of the dye-receptive layer 3 is in the range of from 1.0 to 4.0 µm, preferably in the range of from 1.1 to 3.5 µm, the maximum height (R_{max}) of the surface of the dye-receptive layer 3 is in the range of from 15.0 to 37.0 µm, preferably in the range of from 17.0 to 30.0 µm, and the 10-point average height (Rz) of the surface of the dye-receptive layer 3 is in the range of from 10.0 to 30.0 µm, preferably in the range of from 11.0 to 25.0 µm.

When even any one of the Ra, R_{max} and Rz values exceeds the upper limit of the above Ra, R_{max} and Rz ranges, the dye-receptive layer is rough to look at, which gives no impression of high grade but a strong impression of a low quality. Further, the unevenness of the surface has an adverse effect on the print quality and unfavorably leads to the lack of uniformity in print and the occurrence of pinholes. On the other hand, when even any one of the Ra, R_{max} and Rz values is less than the lower limit of the above Ra, R_{max} and Rz ranges, the surface appearance like plain paper cannot be realized and the appearance unfavorably becomes like the conventional photographic paper. The center line average height (Ra), the maximum height (R_{max}) and the 10-point average height (Rz) are numerical values specified in JIS B0601-1982.

The specular glossiness ($G_s(45°)$) of the surface of the dye-receptive layer 3 is preferably not more than 40%, particularly preferably in the range of from 2 to 15%. The specular glossiness ($G_s(45°)$) is a numerical value specified in JIS-Z-8741-1983.

Preferred examples of methods for forming the dye-receptive layer 3 having a surface roughness falling within the above particular range include the following methods ① to ④.

Method ①: A particulate pigment, such as silica, calcium carbonate, alumina, kaolin, clay, titanium dioxide, barium sulfate, zinc oxide or talc, is incorporated into a resin as a main component of the dye-receptive layer 3. In this case, the content of the particulate pigment is preferably in the range of from 10 to 500% by weight. Method ②: A receptive layer comprising a resin as a main component of the dye-receptive layer 3 is previously formed, and the surface of the receptive layer 3 is then roughened while heating and pressing using a matting metal roller having a predetermined surface roughness. Method ③: A dye-receptive layer comprising the above resin is formed by coating on a substrate of a resin film (for example, a polyethylene terephthalate film), which has been previously matted so as to have a predetermined surface roughness, a substrate sheet 2 is laminated onto the dye-receptive layer through an adhesive, and the matted resin film is then peeled off from the dye-receptive layer to impart a predetermined surface roughness to the dye-receptive layer. This method is the so-called "transfer method." Method ④: An intermediate layer containing expandable microcapsules is provided between the substrate sheet 2 and the dye-receptive layer 3, and the expandable microcapsules are heated and expanded to impart a predetermined roughness to the surface of the dye-receptive layer. Examples of the expandable microcapsule include those prepared by enmicrocapsulating a decomposable expanding agent (foaming agent), which decomposes on heating to evolve oxygen, carbon dioxide gas, nitrogen or other gases, such as dinitropentamethylenetetramine, diazoaminobenzene, azobisisobutyronitrile or azodicarbonamide, or a low-boiling liquid, such as butane or pentane, in a resin such as polyvinylidene chloride or polyacrylonitrile.

The above microcapsules are incorporated into a binder resin, and the content thereof is preferably 1 to 150 parts by weight, still preferably 5 to 50 parts by weight, based on 100 parts by weight of the binder resin (solid basis). When the content is less than 1 part by weight, the cell effect, that is, cushioning property, heat insulation or the like, becomes unsatisfactory. This tendency is significant when the content is less than 5 parts by weight. On the other hand, when the content exceeds 150 parts by weight, the protection of the cells afforded by the binder resin is deteriorated. This tendency becomes particularly significant when the content exceeds 50 parts by weignt.

The cell diameter after the expansion of the microcapsule is in the range of from 10 to 100 µm, preferably 20 to 50 µm. When it is less than 10 µm, the cell effect is small. On the other hand, when it exceeds 100 µm, the surface rough-

ness becomes excessively high, which has an adverse effect on the image quality.

The expanding agent may be incorporated in a material for forming the intermediate layer and, after drying of an intermediate layer, may be heated to the expansion temperature of the microcapsule used, thereby expanding the microcapsule. Alternatively, after the formation of an intermediate layer by coating, the expansion may be carried out simultaneously with drying of the intermediate layer.

Thus, the method ④, unlike the method ①, eliminates the need to add the pigment, so that none of adverse effects (a deterioration in image quality, a feeling of roughness and a lowering in sensitivity and density) of the pigment do not occur. In addition, the method ④ has various advantages over the methods ② and ③, for example, in the elimination of the need to provide a special step or prepare a special film. The dye-receptive layer 3 may be formed by air knife coating, reverse roll coating, gravure coating, wire bar coating or other coating methods. The thickness of the dye-receptive layer 3 is preferably in the range of from about 1.0 to 10.0 µm.

In the present invention, besides the above expandable intermediate layer, an undercoat layer and an intermediate layer may be optionally provided. The format, material and location of the undercoat layer, expanded layer and intermediate layer are the same as those of the undercoat layer, expanded layer and intermediate layer which will be described below in connection with the third invention.

Further, in the present invention, an antistatic agent may be added to the dye-receptive layer 3. Examples of the antistatic agent include known antistatic agents, for example, cationic antistatic agents, such as quaternary ammonium salts and polyamine derivatives, anionic antistatic agents, such as alkyl phosphates, and nonionic antistatic agents, such as fatty acid esters.

Furthermore, the so-called "back coat layer" may be provided on the back surface of the substrate sheet 2 for the purpose of imparting feedability and deliverability to the image-receiving sheet. An example of the back coat layer is an antistatic layer with the above antistatic agent being incorporated therein.

The present invention will now be described in more detail with reference to the following examples and comparative examples.

Example A1

A 62 µm-thick paper substrate sheet (Pyreen DX manufactured by Nippon Paper Industries Co., Ltd.) was provided as a substrate sheet.

A microcapsule-containing coating solution 1 having the following composition for an intermediate layer was coated on the substrate sheet by means of a wire bar at a coverage on a dry basis of 12 g/m^2, and the resultant coating was dried. Thereafter, the coated substrate sheet was allowed to stand in a hot-air drier of 150°C for 1 min to heat and expand the microcapsule.

Coating solution 1 for microcapsule-containing intermediate layer

Emulsion (AE314 manufactured by Japan Synthetic Chemicals, Inc.)	100 parts by weight
Expandable microcapsule (F50 manufactured by Matsumoto Yushi Seiyaku Co., Ltd.)	30 parts by weight
Pure water	30 parts by weight

A coating solution 1 having the following composition for a dye-receptive layer was coated on the intermediate layer by means of a wire bar at a coverage on a dry basis of 4 g/m^2, and the resultant coating was dried, thereby preparing a sample of Example A1 according to the present invention.

Coating solution 1 for dye-receptive layer

Vinyl chloride/vinyl acetate copolymer (#1000D manufactured by Denki Kagaku Kogyo K.K.)	100 parts by weight
Amino-modified silicone (X-22-343 manufactured by The Shin-Etsu Chemical Co., Ltd.)	3 parts by weight
Epoxy-modified silicone (KF-393 manufactured by The Shin-Etsu Chemical Co., Ltd.)	3 parts by weight
Toluene/methyl ethyl ketone (1 part/1 part)	500 parts by weight

Example A2

A sample of Example A2 according to the present invention was prepared in the same manner as in Example A1, except that a 75 µm-thick paper substrate sheet (Sunflower manufactured by Oji Paper Co., Ltd.) was used instead of the substrate sheet used in Example A1.

Example A3

A sample of Example A3 according to the present invention was prepared in the same manner as in Example A1, except that an 88 µm-thick paper substrate sheet (New Age manufactured by Kanzaki Paper Mfg. Co., Ltd.) was used instead of the substrate sheet used in Example A1.

Example A4

A 62 µm-thick paper substrate sheet (Pyreen DX manufactured by Nippon Paper Industries Co., Ltd.) was provided as a substrate sheet.

A coating solution 2 having the following composition for an intermediate layer was coated on the substrate sheet by means of a wire bar at a coverage on a dry basis of 12 g/m^2.

Coating solution 2 for intermediate layer

Emulsion (AE314 manufactured by Japan Synthetic Chemicals, Inc.)	100 parts by weight
Pure water	30 parts by weight

A coating solution 2 having the following composition for a dye-receptive layer was coated on the intermediate layer by means of a wire bar at a coverage on a dry basis of 4 g/m^2, and the resultant coating was dried, thereby preparing a sample of Example A4 according to the present invention.

Coating solution 2 for dye-receptive layer

Vinyl chloride/vinyl acetate copolymer (#1000D manufactured by Denki Kagaku Kogyo K.K.)	100 parts by weight
Amino-modified silicone (X-22-343 manufactured by The Shin-Etsu Chemical Co., Ltd.)	3 parts by weight
Epoxy-modified silicone (KF-393 manufactured by The Shin-Etsu Chemical Co., Ltd.)	3 parts by weight
Ultrafine particles of anhydrous silica (AEROSIL 200 manufactured by Nippon Aerosil Co., Ltd.)	100 parts by weight
Toluene/methyl ethyl ketone (1 part/1 part)	500 parts by weight

Example A5

A sample of Example A5 according to the present invention was prepared in the same manner as in Example A4, except that a 75 µm-thick paper substrate sheet (Sunflower manufactured by Oji Paper Co., Ltd.) was used instead of the substrate sheet used in Example A4.

Example A6

The coating solution 1 for a dye-receptive layer used in Example A1 was coated on a matted polyethylene terephthalate film (Sandmax manufactured by Teijin Ltd.) by means of a wire bar at a coverage on a dry basis of 4 g/m^2, and the resultant coating was dried. Then, the coating solution 2 for an intermediate layer used in Example 4 was coated on the dye-receptive layer by means of a wire bar at a coverage on a dry basis of 12 g/m^2, and the resultant coating was dried. Thereafter, a coating solution 1 having the following composition for an adhesive layer was coated on the intermediate layer by means of a wire bar at a coverage on a dry basis of 5 g/m^2, and the resultant coating was dried. The substrate sheet (Pyreen DX manufactured by Nippon Paper Industries Co., Ltd.) used in Example A1 was laminated

onto the adhesive layer. Thereafter, the matted polyethylene terephthalate was peeled off, thereby preparing a sample of Example A6 according to the present invention.

Coating solution 1 for adhesive layer

Vinyl acetate adhesive (Esdine 1011 manufactured by Sekisui Chemical Co., Ltd.)	100 parts by weight
Toluene/methyl ethyl ketone (1 part/1 part)	300 parts by weight

Example A7

A sample of Example A7 according to the present invention was prepared in the same manner as in Example A6, except that a 75 µm-thick paper substrate sheet (Sunflower manufactured by Oji Paper Co., Ltd.) was used instead of the substrate sheet used in Example A6 and the following coating solution 3 for a dye-receptive layer was used instead of the coating solution 1 for a dye-receptive layer used in Example A6.

Coating solution 3 for dye-receptive layer

Vinyl chloride/vinyl acetate copolymer (VYHD manufactured by Union Carbide Corporation)	100 parts by weight
Amino-modified silicone (KS-343 manufactured by The Shin-Etsu Chemical Co., Ltd.)	3 parts by weight
Epoxy-modified silicone (KF-393 manufactured by The Shin-Etsu Chemical Co., Ltd.)	3 parts by weight
Antistatic agent (Plysurf A208B manufactured by Dai-Ichi Kogyo Seiyaku Co., Ltd.)	2 parts by weight
Toluene/methyl ethyl ketone (1 part/1 part)	500 parts by weight

Example A8

A 81 µm-thick paper substrate sheet (OK Supercoat manufactured by Oji Paper Co., Ltd., 104.72 g/m^2) was provided as a substrate sheet.

A coating solution 2 having the following composition for an intermediate layer was coated on the substrate sheet by means of a wire bar at a coverage on a dry basis of 15 g/m^2, and the resultant coating was dried.

Coating solution 2 for intermediate layer

Emulsion (XB4085 manufactured by Tohpe Corporation)	100 parts by weight
Pure water	30 parts by weight

The coating solution 1 for a dye-receptive layer used in Example A1 was coated on the intermediate layer by means of a wire bar at a coverage on a dry basis of 4 g/m^2, and the resultant coating was dried. Thereafter, the surface of the dye-receptive layer was subjected to surface treatment in such a manner that it was heated and pressed by means of a matting metal roll under the following conditions, thereby preparing a sample of Example A8 according to the present invention.

Conditions for surface treatment using matting metal roll

Matting metal roll surface:	Ra = 3.0 µm, R_{max} = 30.0 µm, Rz = 25.0 µm
Matting metal roll temp.:	90°C
Contact pressure:	2 Kg/cm^2
Speed:	5 m/min

Example A9

A sample of Example A9 according to the present invention was prepared in the same manner as in Example A8, except that the conditions for the surface treatment using the matting metal roll were varied as follows.

Conditions for surface treatment using matting metal roll

Matting metal roll surface:	Ra = 3.4 μm, R_{max} = 35.0 μm, Rz = 28.0 μm
Matting metal roll temp.:	100°C
Contact pressure:	2.3 Kg/cm^2
Speed:	5 m/min

Comparative Example A1

A sample of Comparative Example A1 was prepared in the same manner as in Example A1, except that the expandable microcapsule was removed from the microcapsule-containing coating solution 1 for an intermediate layer used in Example A1.

Comparative Example A2

A sample of Comparative Example A2 was prepared in the same manner as in Example A6, except that a conventional polyethylene terephthalate film (Lumirror manufactured by Toray Industries, Inc., 12 μm), which had not been matted, was used instead of the matted polyethylene terephthalate film used in Example A6.

The thermal transfer image-receiving sheet samples (Examples A1 to A9 and Comparative Examples A1 and A2) thus prepared were subjected to the following measurement and evaluation.

Measurement and evaluation items

(1) surface roughness (JIS B0601 1982)

The center line average height (Ra), maximum height (R_{max}) and 10-point average roughness (Rz) with respect to the surface roughness of the dye-receptive layer 3 were measured using as a measuring apparatus Surfcom 570A-3DF manufactured by Tokyo Seimitsu Co., Ltd.

(2) Specular gloss of surface (G_s (45°))

The specular gloss of the surface was measured using as a measuring apparatus a varied-angle gloss meter VG-1001DP manufactured by Nippon Denshoku Co., Ltd. according to JISZ-8741-1983.

(3) Texture of surface (dye-receptive layer) of thermal transfer image-receiving sheet

The surface texture of the dye-receptive layer was evaluated by visual inspection and touch according to a sensory test. The criteria for the evaluation were as follows.

◎ Suitable matte feeling with texture similar to that of plain paper
○ No difference in texture from plain paper
△ Somewhat difference in texture from plain paper
X Apparent difference in texture from plain paper

The results of the measurement and evaluation were given in the following Table 1.

Table A1

(Results)					
Thermal transfer image-receiving sheet	Ra (µm)	R_{max} (µm)	R_z (µm)	Gs (45°) (%)	Texture of receptive layer
Ex. A1	1.9	24.9	20.0	8.0	◎
Ex. A2	1.7	23.7	19.7	7.5	◎
Ex. A3	1.7	24.8	17.6	7.6	◎
Ex. A4	1.1	15.8	10.7	12.0	○
Ex. A5	1.1	16.2	11.5	10.5	○
Ex. A6	1.2	18.5	11.2	4.8	◎
Ex. A7	1.3	17.6	10.5	5.5	◎
Ex. A8	2.9	28.5	23.0	15.0	○
Ex. A9	3.2	33.0	27.0	13.0	○-△
Comp. Ex. A1	0.6	5.4	3.4	61.0	X
Comp. Ex. A2	0.7	2.6	1.8	66.0	X

The above results clearly shows the effect of the present invention. Specifically, according to the present invention, since the dye-receptive layer constituting the thermal transfer image-receiving sheet has a surface roughness falling within a specific range, the surface of the dye-receptive layer has a texture close to plain paper and, hence, can satisfy requirements for use in offices.

Claims

1. A thermal transfer image-receiving sheet comprising a substrate sheet and a dye-receptive layer provided directly or through an intermediate layer on one surface of said substrate sheet,
   said dye-receptive layer having a surface roughness of center line average height Ra = 1.0 - 4.0 µm, maximum height R_{max} = 15.0 - 37.0 µm and 10-point average height Rz = 10.0 - 30.0 µm.

2. The thermal transfer image-receiving sheet according to claim 1, wherein the specular glossiness (G_s(45°)) of the surface of said dye-receptive layer is not more than 40%.

3. The thermal transfer image-receiving sheet according to claim 1 or 2, wherein said substrate sheet comprises paper having a thickness of 40 to 250 µm.

4. The thermal transfer image-receiving sheet according to claim 1, 2 or 3 wherein an expanded layer is provided between the substrate sheet and the receptive layer.

Patentansprüche

1. Bildempfangsblatt für thermische Übertragung, umfassend ein Substratblatt und eine Farbempfangsschicht, welche direkt oder durch eine intermediäre Schicht auf einer Oberfläche des Substratblatts angeordnet ist, wobei die Farbempfangsschicht eine Oberflächenrauhigkeit mit einem arithmetischen Mittenrauhwert Ra = 1,0-4,0 µm, einem Maximalrauhwert R_{max} = 15,0-37,0 µm und einem arithmetischen 10-Punkt-Rauhwert Rz = 10,0-30,0 µm aufweist.

2. Bildempfangsblatt für thermische Übertragung nach Anspruch 1, wobei der Spiegelglanz (G_s (45°)) der Oberfläche der Farbempfangsschicht nicht mehr als 40% beträgt.

3. Bildempfangsblatt für thermische Übertragung nach Anspruch 1 oder 2, wobei das Substratblatt Papier mit einer Dicke von 40 bis 250 µm umfaßt.

4. Bildempfangsblatt für thermische Übertragung nach Anspruch 1, 2 oder 3, wobei eine expandierte Schicht zwischen dem Substratblatt und der Empfangsschicht angeordnet ist.

Revendications

1. Feuille réceptrice d'image par transfert thermique comprenant une feuille substrat et une couche de réception de colorants prévue directement ou par l'intermédiaire d'une couche intermédiaire sur une surface de ladite feuille substrat,
   ladite couche de réception de colorants ayant une rugosité de surface moyenne arithmétique Ra = 1,0 à 4,0 µm, une rugosité maximale R_{max} = 15,0 à 37,0 µm et une rugosité moyenne sur 10 points Rz = 10,0 à 30,0 µm.

2. Feuille réceptrice d'image par transfert thermique selon la revendication 1, dans laquelle le brillant spéculaire (Gs(45°)) de la surface de ladite couche de réception de colorants n'est pas supérieur à 40 %.

3. Feuille réceptrice d'image par transfert thermique selon la revendication 1 ou la revendication 2, dans laquelle ladite feuille substrat comprend du papier ayant une épaisseur de 40 à 250 µm.

4. Feuille réceptrice d'image par transfert thermique selon la revendication 1, la revendication 2 ou la revendication 3, dans laquelle il est prévu une couche expansée entre la feuille substrat et la couche de réception de colorants.

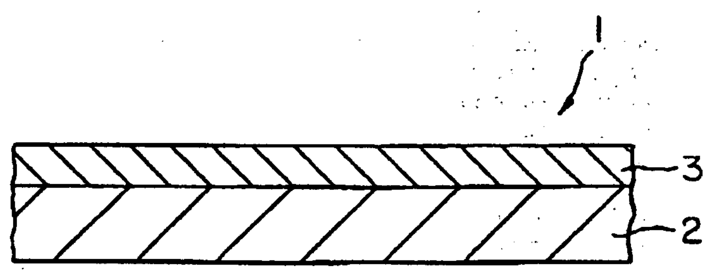

FIG. 1